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Factsheet

Pest Management Program for Grape Series

PHOMOPSIS CANE AND LEAF SPOT OF GRAPES

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For more than 60 years the grape industry recognized a disease "dead arm" of grapes attributed to the fungus *Phomopsis viticola* (Sacc). However, in the 1970's the actual "dead arm" symptom was shown to be caused by a second fungus, *Eutypa armeniaca* (Hansf. & Carter), and the disease was renamed EUTYPA DIEBACK. The symptoms caused by *P. viticola* were established as a separate disease known as PHOMOPSIS CANE AND LEAF SPOT. The symptoms of these two diseases and the control strategies are quite different. The biology and control of *Eutypa* dieback will be described in another Factsheet.

Phomopsis cane and leaf spot occasionally causes serious economic losses, especially following unusually wet spring weather. Severe infection during the early season may result in mechanically weakened shoots that may break during strong winds, or infected clusters, parts of which desiccate and break off, or even infected berries that shrivel and shed before harvest.

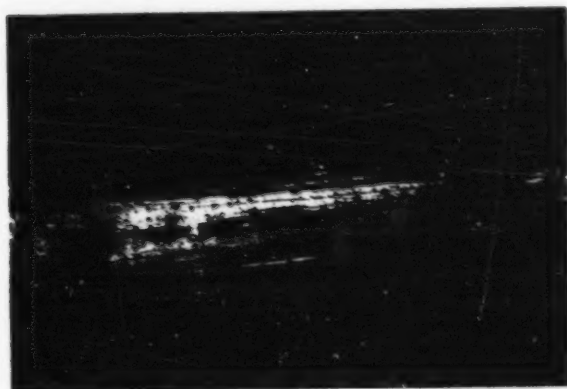


Figure 1. Overwintering lesions on cane wood

BIOLOGY

Phomopsis overwinters in lesions, particularly on one-year-old wood infected by the fungus *P. viticola* the previous season (Figure 1). In early spring, rainfall releases spores from pycnidia on overwintering lesions. Newly released spores are splashed onto developing leaves and shoots, with new lesions appearing quickly on the new growth. The most extensive development of this disease occurs from bud break until shoots are 10 to 15 cm in length. The fungus does not appear to be active during the summer months but may reappear in late summer on leaves at the ends of shoots if cool wet weather occurs (see life cycle diagram).

CROP DEVELOPMENT STAGES AND DISEASE SYMPTOMS

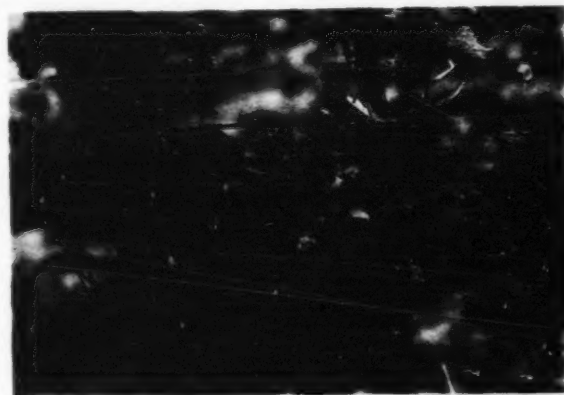


Figure 2. Susceptible young, green shoots and leaves in early season



Figure 3. Lesions coalescing on young shoot

1. Bud Break In early spring, cool temperatures (average 5° to 7° C) result in slow shoot growth leaving green tissue susceptible to infection by *P. viticola*. During periods of wet weather, spores from overwintering pycnidia are washed or splashed onto susceptible shoots with symptoms appearing 3 to 4 weeks after infection. Shoots of 3 to 15 cm in length are very susceptible to infection under prolonged wet conditions (Figure 2). Infection is noticed as small elongated black lesions, each resembling a small nick or cut in the shoot. When numerous, the lesions may coalesce, causing the shoot to appear cracked or blotchy (Figure 3). In some instances, heavy infections may encircle the cane, making it susceptible to breakage in high winds or causing the bark to split, exposing the woody fibres of the cane.

2. Prebloom The first leaf infections may occur shortly after bud break as the new shoots elongate. Leaf infections are characteristically small, light green or chlorotic, spots with dark centres while leaf veins may have dark brown or black necrotic spots (Figure 4). Leaves with heavy infections are usually puckered or distorted, and often torn or with a "shot hole" appearance where the necrotic spots have fallen out. This injury resembles that caused by the phytotoxic response to pesticide burn. Often these leaves will drop, especially if the petiole is infected.



Figure 4. Leaf infection by *P. viticola* and resultant puckering

3. Bloom If prolonged or frequent wet weather occurs during bloom, severe *Phomopsis* infection of the cluster stalk (rachis), its branches, and even the floral parts, can occur (Figure 5). Rachis sections of the cluster may be girdled, desiccate and fall away, resulting in a direct crop reduction. Many other lesions may remain as dark, discrete, elongated lesions or coalesce into dark brown areas, where the cluster may break as the fruit matures.

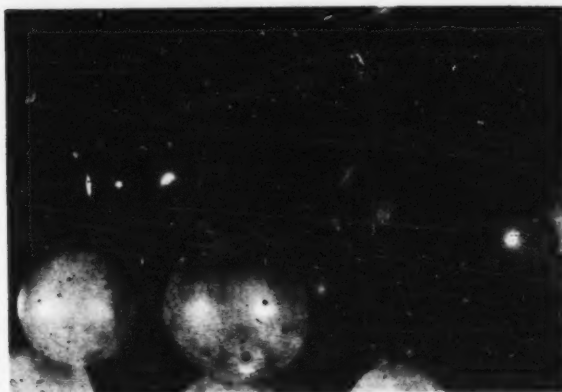


Figure 5. Numerous infection sites on rachis

4. Fruit infection Infection of small green fruit may occur early in the season during prolonged wet weather and in vineyards where there is plentiful overwintering inoculum. These infections remain dormant or latent until the fruit starts to mature the infections resume growth causing a rot of the berry. Rotten berries may develop an extremely unpleasant acid taste, which is highly undesirable in fruit or juice. Infected berries shrivel and mummify with a rough pimpled surface studded with pycnidia, closely resembling the fruit symptom of blackrot. Fruit rot from *P. viticola* have been observed only occasionally in Ontario.

CONTROL STRATEGIES

Phomopsis can be minimized by the combination of good cultural practices and fungicide treatments. Labrusca (e.g. Niagara), American hybrids (e.g. Dutchess) and French hybrids (e.g. De Chaunac) are more susceptible than the vinifera cultivars to *P. viticola*, but few cultivars are resistant. Since the fungus spreads short distances mostly within and between neighbouring vines, pruning debris should be removed from the vineyard and burned, or shredded and disked into the vineyard soil.

Chemical protection can usually be achieved with two applications of an effective fungicide. The first spray should be applied when shoots are 1 to 3 cm long and the second when shoots are 10 to 15 cm in length. If cool, wet growing conditions exist, an additional application may be needed. A listing of currently available fungicides is given in OMAF Publication 360, *Fruit Production Recommendations*.

ACKNOWLEDGEMENTS

Photographs courtesy of N.Y.A.E.S. Geneva, N.Y. and OMAF, Plant Industry Branch, Vineland Station
Life Cycle Of *Phomopsis* Cane & Leaf Spot of Grapes
(Drawing by R. Sticht, N.Y.A.E.S. Cornell University, Geneva, N.Y.)



pycnidia
protrude
through the
surface



pycnidiospores
exude from pycnidia
in wet weather
and
are rain-splashed
to developing
shoots, leaves
and clusters



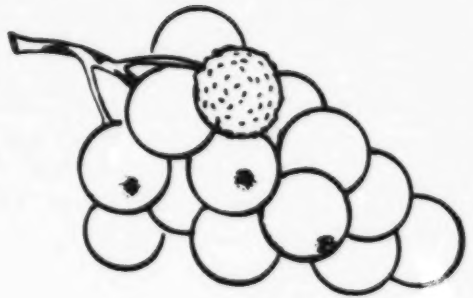
cane and leaf spot symptoms
appear 3-4 weeks after infection



rachis infection
occurs during
spring and
early summer



fruit infection occurs
during and shortly
after bloom



fruit and rachis infections
remain latent until late
in the growing season,
near harvest



black fruiting bodies (pycnidia)
overwinter on the vine
in infected dormant canes
and rachises

PHOMOPSIS CANE AND LEAF SPOT

